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ABSTRACT

Findings of a conference that reviewed and evaluated design decisions concerning the Decision Support System (DSS) Demonstrator are summarized. The DSS Demonstrator was designed by the National Center for Higher Education Management Systems as an example of the way in which microcomputer technology can support and make more effective planning and management activities in higher education. The Demonstrator can promote understanding of spreadsheet concepts and applications, data organization and linkages, data format and screen design, and the potential for effective management reporting. The target audience was senior officials and executives responsible for planning and management activities; a secondary audience was those who teach about the use of microcomputers and about software tools like LOTUS 1-2-3. Attention is directed to the following design considerations: primary purpose of the DSS Demonstrator, guiding philosophy, scope (applications), target audience, skill level, technical features of the software, standards, impact (i.e., knowledge of basic concepts and translating from an application of low interest to one of high interest); and the utility of the DSS Demonstrator (immediate usage of applications, expanding current templates, and learning aid). A list of conference participants is included. (SW)

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DECISION SUPPORT SYSTEMS PROJECT

DESIGN REVIEW CONFERENCE

OCTOBER 14-15, 1984

SUMMARY REPORT OF FINDINGS

William L. Tetlow

National Center for Higher Education Management Systems

November 30, 1984

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I. Preface

Many considerations influenced the final design of the NCHEMS DSS Demonstrator. Some represented deliberate delimitations of the scope so as to achieve a useful and practical result with the limited resources available. Others were the result of technical strengths and/or limitations of microcomputer software and hardware. Still others were decisions made by the project team after considerable debate and discussion. The purpose of the design review conference was to review and evaluate these design decisions. Participants in the conference were the principal members of the project team, project consultants, and representatives from several of the beta test sites. This report is a summary of the findings of the conference participants.

II. Conference Participants

Mr. John W. Bartram, Senior Staff Consultant, NCHEMS

Dr. Paul T. Brinkman, Project Staff, NCHEMS

Ms. Elizabeth Erickson, Project Staff, NCHEMS

Dr. John A. Dunn, Vice-President Planning, Tufts University

Dr. Richard Harpel, Director of Planning and Assistant to the Chancellor, The University of Colorado - Boulder

Dr. George Pierce, Vice-President Administration, Seattle University

Dr. Mary Sapp, Systems Analyst for Planning and Institutional Research, The University of Miami

Sister Carolyn Snegoski, Director of Institutional Planning, College of St. Mary

Mr. Michael Stevenson, Director, Research & Computer Education, Mt. Hood Community College

Dr. William. L. Tetlow, Project Director, NCHEMS

Dr. Lawrence Wright, Vice-President Finance, Seattle Pacific University

III. Review of Specific Design Considerations

A. Primary Purpose: To provide exemplar illustrations of the way in which microcomputer technology could be used to support planning and management in higher education.

Review Findings: The DSS Demonstrator helped users learn about or extend their knowledge of spreadsheets concepts and applications, data organization and linkages, data format and screen design and the potential for effective management reporting. It was of value to novices for conceptual understanding of potential applications and also demonstrated features of the medium that competent LOTUS 1-2-3 users had not discovered. Additional applications were desired by almost everyone but the initial set of four was considered very useful.

B. Guiding Philosophy: To be truly effective, specific DSS must be constructed by the end-user, be congruent with his/her cognitive style, and incorporate the decision parameters that she/he deems relevant. Thus, construction of a generic DSS (turnkey system) was deemed infeasible and NCHEMS efforts were directed toward demonstration and illustration of the potential of the technology.

Review Findings: A conundrum quickly emerges when conferees and others discuss the merits of designing demonstrators as opposed to constructing operational software that would be of immediate use . Users are clearly seeking very specific applications. When the incredible diversity of higher education institutions is considered, however, common data structures, elements and models are impossible to achieve. Even subsets of the

total - community colleges for example - differ markedly in the specifics of funding mechanisms, internal operations, organization, etc. Furthermore, experience has indicated that decisionmakers are most comfortable with systems that have been specifically constructed or tailored to their own particulars.

The DSS Demonstrator as it is now configured is considered primarily a learning tool that can be used best by individuals or groups for learning about decision support systems, exemplar practice in microcomputer systems, and about the capabilities of LOTUS 1-2-3. It also has use a a training tool for live planning sessions with decisionmaking groups. Most all conferees felt, however, that the production of many more application examples would be most useful.

C. Scope: Since electronic spreadsheets would be deemed, prima facie, to be applicable primarily to financial and secondarily to guantitative data, NCHEMS attempted to incorporate exemplar applications in academic management matters. The intent was to illustrate a range of applications. In addition, for the initial effort a single product was designed rather than separate versions for each higher education segment.

Review Findings: The design principle was sound for the initial product. Conferees now desire many more specific applications that are less extensive than the first four, and at the same time are specifically designed for different types of institutions. The DSS Demonstrator was designed to illustrate applications in a small four-year private liberal arts

institution. Now conferees would like applications for different segments, such as public universities and two-year institutions, as well as different types of applications. Suggestions for future applications included: departmental level budgeting, state and federal data reporting, comparative institutional data, cost analysis, program comparison and evaluation, financial aid calculations, etc.

D. Perspective: NCHEMS chose a global institutional perspective for the initial DSS Demonstrator as the one most likely to be relevant across the full spectrum of higher education - public/private, 2Yr/4Yr, etc.
Review Findings: Conferees agreed that this was useful for the initial product since it was intended as a demonstrator. This design principle could be relaxed as additional applications are designed and released.

E. Target Audience: Individuals involved in planning and management activities for colleges and universities were the intended primary audience. Senior officials, rather than technical assistants were the targeted audience since they are the ones who make or influence policy. In NCHEMS belief, maximum impact would be achieved if the senior officials gained at least a conceptual understanding of the potential of the medium. Actual construction of a DSS might be made by a technician or assistant for subsequent manipulation by a decisionmaker.
Review Findings: Senior administrators who are inclined to personally use or construct a DSS are presently a minor proportion

of the total. Advice to NCHEMS was to focus efforts on high level analytical staff who are most likely to construct a DSS and who have the best chance of promoting understanding within the institution. It was felt that while the development of rational decision support aids needs the support of executive officers most do not desire to be intimately involved because they perceive that their personal efforts are more likely to be of maximum effectiveness in other arenas. For demonstration purposes alone the product is more extensive than necessary for those desiring only conceptual understanding.

F. Skill Level: Since there exist a plethora of on-line tutorials, videotape training aids, introductory classes, etc. NCHEMS decided not to duplicate efforts aimed at beginners and novices. Furthermore, it was intended to keep any commentary or "manual" to an absolute minimum since large and thick manuals appear to be a motivational deterrent to learning.

Review Findings: Some of the conferees desired that more elementary level help with LOTUS 1-2-3 and more explication be incorporated. The vast majority, however found the manual to be "just right", unusually well designed and written, and containing so much useful information that it can be regarded as a useful shelf reference. Suggestions were received to expand section 2 on "Template Design Principles", add a section on how to make modifications to the templates, and to add an appendix on transferring data to and from mainframe computers. In addition, some further explication would be useful in the FACULTY template

which incorporated some of the most technically difficult LOTUS 1-2-3 concepts.

G. Technical Illustration: Based on the assumption that few, if any, college officials would have the time or inclination to explore fully the potential of the medium or even begin to apply it expertly, efforts were made to illustrate, via relevant examples, as many technical features of the software as NCHEMS possibly could.

Review Findings: The effort was effective but a few additional areas could be expanded or enhanced. More graphic illustrations were desired, especially those geared for executive summary and presentation. Illustrations of data transfer between microcomputers and mainframes and demonstrated linkages with word processing software were also suggested.

H. Standards: Experts inform us that bad or sloppy practice and technical execution is the norm especially with regard to modelling activities. It was our desire to promote "good practice" by way of example. Abstracts, Instructions, Layout Maps, Worksheet Design and Layout, and exemplary technical execution are examples of our approach.

Review Findings: The end result was considered exemplary and capable of standing as a general standard for development of specific DSS and electronic spreadsheet applications. Most frequently mentioned were screen oriented design, attention to screen formatting effects, menu construction, abstracts, and layout maps. In the modelling applications it was suggested that

data be organized for "downloading" in blocks and that data input and assumption areas be specifically designed and delimited.

I. Impact: In NCHEMS judgment, only a very small percentage of individuals are adept at concept transference. Therefore, to illustrate the potential relevance to higher education management needs, NCHEMS felt it was important to use very specific higher education examples. In addition, NCHEMS expended considerable effort on format, style, and presentation technique in an attempt to improve communication and impact. Thus an attempt was made to minimize shorthand abbreviations, mnemonics, information overload, technical jargon, etc.

Review Findings: The almost universal behavior pattern was for individuals to go directly to a template that had specific application utility for them. The general finding is that while people can make a translation from an application of little interest to them to one that is of fundamental interest they are seldom willing to do it. The specific use of higher education applications was effective in illustrating the applicability of the medium to higher education planning and management problems and, in terms of general objectives, NCHEMS DSS Demonstrator was successful. Attention to formatting and the minimal use of mnemonics greatly aided the understanding of the concepts. However, it appears that to get some individuals exposed to all of the LOTUS 1-2-3 features it will be necesssary to incorporate them in a set of templates in the same professional or subject interest area.

J. Utility: NCHEMS goal was to produce templates with at least one of them having an 80% utility factor for the recipient. In other words, an application that would need minor revision (less than 20% effort) to be immediately useful. Overall, NCHEMS envisage three primary user subgroups:

1. Immediate usage of some demonstrator applications.
2. Building block usage - extraction of subsets of templates for use in DSS construction.
3. Illustration/reference/inspiration - learning useful tips, techniques, etc.

Review Findings: Only a few institutions that were small private colleges and universities with enrollments of approximately 3000 students found the templates immediately useful as presented. This finding is not at all suprising since those are the specifications around which the templates were designed. The predominant uses were as an illustration, reference and inspiration source. Several constructed adaptations of the applications and then placed them into use. In sum, all three potential use modes were realized but the predominant use was as a learning tool.

K. Miscellaneous Findings: Conferees were asked to provide suggestions for future NCHEMS efforts. While numerous suggestions were forthcoming, such as large scale database applications, demonstrator use of graphics and statistical packages, similiar demonstrator treatment of more comprehensive integrated packages

(e.g Symphony, Framework, etc) there was a clear consensus that conferees wanted NCHEMS to continue its developmental and dissemination efforts. Users expect NCHEMS to "remain at the cutting edge", to examine and test available software and hardware, and to then show those "in the trenches" how to make effective use of this technology in higher education management and governance. Desire was also expressed for expansion of training opportunities and NCHEMS support of networking services for groups using the prototypes and developing their own applications.

IV. Summation of Findings

The NCHEMS DSS Demonstrator was designed as an exemplar illustration of the way in which microcomputer technology can be used to support, and make more effective, planning and management activities in higher education. It was intended as a learning tool that would have applicability across the entire spectrum of higher education and be useful to novices as well as experts. The target audience was senior officals and executives responsible for planning and management activities; a secondary audience was for those who teach others about the use of microcomputers and about software tools like LOTUS 1-2-3.

Conferees thought that the product was well designed, thoughtfully developed, and very effective as a demonstrative tool for learning purposes. The DSS Demonstrator was considered exemplary and capable of standing as a general standard for development of specific DSS and electronic spreadsheet applications. Its limitations are that it assumes a good basic knowledge of microcomputer hardware and LOTUS 1-2-3 software and has limited utility as immediately operational software.

The DSS Demonstrator helped users learn about or extend their knowledge of spreadsheets concepts and applications, data organization and linkages, data format and screen design and the potential for effective management reporting. It was of value to novices for conceptual understanding of potential applications and also demonstrated features of the medium that competent LOTUS 1-2-3 users had not discovered. Additional applications were

desired by almost everyone but the initial set of four was considered very useful.

The design principles were considered sound for the initial product. Conferees now desire many more specific applications that are less extensive than the first four, and at the same time are specifically designed for different types of institutions. Suggestions for future applications included: departmental level budgeting, state and federal data reporting, comparative institutional data, cost analysis, program comparison and evaluation, financial aid calculations, etc.

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